INFERRING PLACES OF ORIGIN OF TWO PCN FROM SERBIA USING MOLECULAR TOOLS

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INTRODUCTION

- Phylogenetic relationships are nowadays studied at the molecular level (protein & nucleotide sequences)
- Obtained dendrograms reflect evolutionary relationships and indicate potential ancestor or the paths of geochronologic speciation
- Potato originated in the highlands of Peru, around lake Titicaca at least 7,000 years ago. The food security provided development of great civilisations such as the Huari & Inca
INTRODUCTION

- In the 16th century the Spanish conquistadores brought to Europe the potato along with its parasites-potato cyst nematodes (PCN): *Globodera pallida* & *G. rostochiensis*
- PCN cause up to 300 M pound sterling worth of damage to the potato in the EU each year
- The presence of quarantine nematodes: *Globodera pallida* & *G. rostochiensis* in our country raised the question: Where did they come from?
MATERIAL & METHODS

- Dispersal – Vicariance Analysis (DIVA) is one of the most widely used methods of inferring biogeographic histories.
- S-DIVA complements DIVA and statistically evaluate alternative ancestral ranges at each node.
- Phylogeny was inferred under Bayesian method implemented in S-DIVA based on 15002 trees and “burn in” function of 1500.51 populations (NCBI GenBank) compared.
RESULTS & DISCUSSION

- Dendrogram regarding *G. rostochiensis* shows clades originating from different places.
- Milatovići belong to the clade with most world populations, also Peruvian populations.
- The second clade comprises Euro-Asian (York-UK, Moscow-RU) and Peruvian populations (Anta and unnamed population).
- Third clade: European populations (Scarcliffe-UK & Poland) with Bolivia (Tiraque) & Mexico (Cuapiaxtla).
RESULTS & DISCUSSION

- G. pallida dendrogram - 3 clades:
  - European-Peruvian: Poland, Ukraine, UK, Spain, Netherlands, Romania, Ireland, Serbia, Canada, NZ & Cusco, Pilayo, Amantani, Capachica from Peru
  - Peruvian-Chilean clade: Taquile, Apurimac, Porvenir, Puno, Fillipic, Terre de Feu, Cassola
  - Strictly Peruvian clade: Santa Ana, La Libertad, Huancabamba, Huamachuco, Tiabaya, Otuzco, Peru-Bolivian border

Clade: Santa Ana, La Libertaba, Huamachuco, Peruvian-Bolivian border
CONCLUSIONS

- The biogeographic history of Serbian PCN indicate the possible ancestors originate from Peru.

- The potential places of origin for Milatović (G. rostochiensis) could be Allpachaka and for Kladnica (G. pallida)- Cusco.

- The presence of PCN in our country is not the result of direct import of infected potatoes from Latin America, but it is likely that a country in Europe was a “transition host”.
Thank you for your attention!